CONTRIVE

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GsmTerminal

USER GUIDE

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Safety Information

Radio devices have limitations in the vicinity of electronic devices :

- Do not install the GsmTerminal near medical devices like pacemakers or hearing aids.
  The GsmTerminal may interfere with the operation of these devices.

- Switch the GsmTerminal off when flying.
  Secure it so that it cannot be switched on inadvertently.

- Do not install the GsmTerminal near petrol stations, fuel depots, chemical plants or blasting operations when the GsmTerminal can disturb the operation of technical equipment.

- Interference can occur if the device is used near televisions, radios or PCs.

- In order to avoid possible damage, we recommend that you only use the specified accessories.
  These have been tested and shown to work well with GsmTerminal.
  However, the warranty does not cover these accessories.

The warranty does not apply in the event of improper use.

Safety Information

GsmTerminal is not authorized for use as critical component in life-support devices or systems unless a specific written agreement regarding such intended use is entered into between the customer and Contrive prior to use.

Life-support devices or systems are devices or systems intended for surgical implantation into the body or to sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labelling and user's manual, can be reasonably expected to result in significant injury.

No complex software or hardware system is perfect. Bugs are always present in a system of any size. In order to prevent danger to life or property, it is the responsibility of the system designer to incorporate redundant protective mechanisms appropriate to the risk involved.

All GsmTerminals are 100% functionally tested. Specifications are based on characterization of tested sample units rather than testing over temperature and voltage of each unit.

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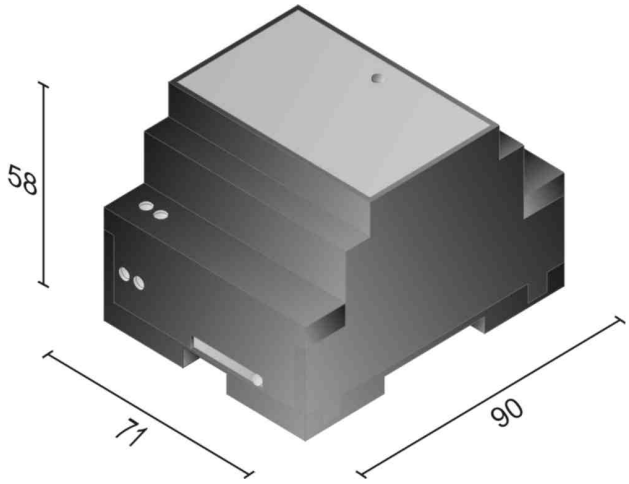
Product description

The GsmTerminal is an industrial GSM modem for the transfer of data, SMS and faxes in GSM networks. Industrial standard interface and an integrated SIM card reader mean it can be used rapidly, easily and universally as a dual band GSM Terminal.
Its performance bandwidth and the robust housing make it easier to quickly implement new applications in areas such as telemetry, telematics and remote control.

The features, functions and interfaces of the GsmTerminal are described below.

All the interfaces are integrated in the housing. The connections are suitable for use in domestic and industrial environments.



The GsmTerminal is based on proven RF technology By Telit Mobile Terminals S.p.A.

Product description

Highlights

- Dual band EGSM900 / GSM1800
- Data, SMS and Fax
- R&TTE approval
- Easy to integrate
- Industrial interfaces
- LED display
- Standard industry and automotive voltage range
- Highly compact, light and powerful
- Embedded omnidirectional antenna (type A)
- External antenna connector (type X)

Applications

- Teleservice
- Security systems
- Telematics
- Telemetry
- Remote monitoring
- Remote meter reading
- Vending machines
- Remote configuration
- POS terminals
- PDAs
- Automotive application and Fleet Management

Features

Product data

- Dual band EGSM900 and GSM1800
- Certified in accordance with GSM phase 2/2+
- Output performance :
  - Class 4 (2W) for EGSM900
  - Class 1 (1W) for GSM1800
- Control via AT commands
- Power supply voltage 8÷38 Vdc, 6÷29 Vac
- Power consumption 3 W $_{MAX}$
- Operating temperature 0÷55°C *
- EN-50022 rail 4 modules enclosure
- Weight approx : 180 g
- Protection class EN-60529 : IP40 (properly fitted)

* System could operate in extreme functional condition -10°C ÷ +65°C

Certification

- R&TTE approval (Directive 1999/5/EG)
- Low Voltage Directive 73/23/EEC
- EMC directive 89/336/EEC

SMS

- Point to point MT (Mobile Terminated)
- Point to point MO (Mobile Originated)
- SMS cell broadcast

Data

- CSD up to 14400 bps

Fax

- Group 3, classes 1,2

Features

Supplementary services

- Call Barring
- Call Forwarding
- Advice of Charge
- Automatic Answer for Data and Fax
- Calling Line Identification Presentation (CLIP)
- Calling Line Identification Restriction (CLIR)
- Closed User Group supplementary services (CUG)
- Phone book
- DTMF (Dual Tone Multi Frequency)

Interfaces

- Power supply connector 2,5mm^2 (AWG14)
- Start / Stop input connector 2,5mm^2 (AWG14)
- Antenna connector FME male (type X)
- EIA-232 interface Sub-D 9 (female)

Accessories

- Omnidirectional planar antenna
- Directional high gain antenna
- Power supply units
- Interface converters

Installation

Package contents

- GsmTerminal (1010.00.00)
- User Guide (B1010eng)
- EIA232 cable 1:1 (ICOC23-SC)

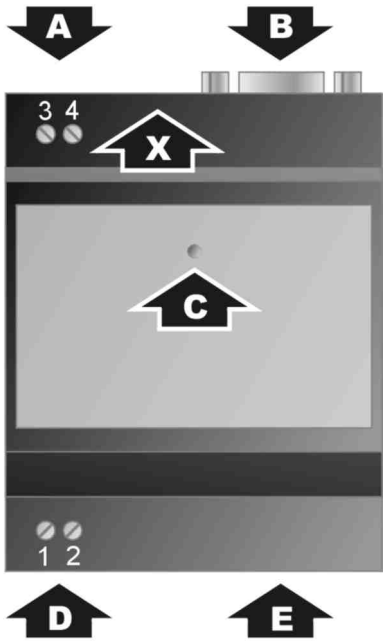
Safety and Installation information

- The Terminal should be installed and set up only by qualified personnel
- If a power supply unit is used to supply the GsmTerminal, it must meet the demands placed on SELV circuits in accordance with EN60950. When using batteries and accumulators, adhere to relevant regulations.
- The maximum permissible connection length between GsmTerminal and supply source is 3 m.

Mounting the GsmTerminal

GsmTerminal can be installed on any standard EN-50022 rail by simple snap-in.
A minimum protection degree IP40 must be guaranteed, raised to IP54 for open air application.

Front view



A. Start/Stop contact input
B. EIA-232 interface
C. LED status indicator
D. Power Supply input
E. SIM card holder

X. RG174 cable stub with FME male jack (type X only)

Interface description

The following interfaces are available on the GsmTerminal:

- Connector for power supply
- Connector for start/stop contact input
- Mini SIM card holder
- EIA-232 interface (V.24/V.28) Sub-D 9 (female)
- Antenna connector FME male (type X)

Power supply

GsmTerminal receives its power supply from terminal 1 and 2, on the left of bottom side.
The voltage must be within 8÷38 Vdc or 6÷29 Vac.

Polarity reversal protection

Since GsmTerminal can be supplied by direct or alternating current, the power supply input is polarity independent.

Overvoltage protection

Overvoltages are suppressed by internal varistors on the power supply input.

Fuses

An internal automatic fuse ensures electrical safety in the event of faults.
If an external protection should be provided, connect a fast 1,5 A fuse on the positive line of the power supply.

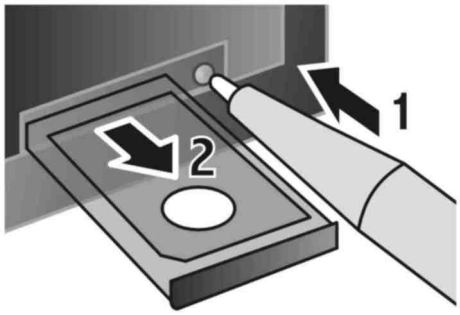
Interference immunity

- The cable length must not exceed 3 m
- Max load current 1,5 A
- Nominal signal range 0...+40V
- Electrical fast transient burst protection requirements in accordance with ETS 300-342-1
- Electrostatic discharge requirements in accordance with ETS 300-342-1
- Immunity RF common mode 0,15÷80 MHz in accordance with ETS 300-342-1
- Voltage dips and interruption

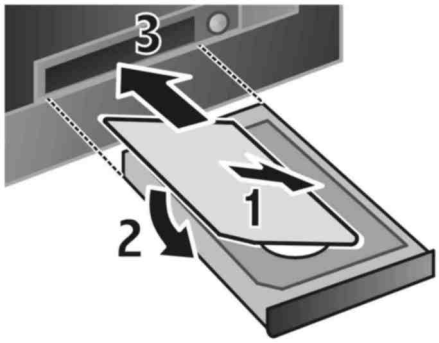
SIM card

The SIM card receptacle is intended for 3V SIM cards in accordance with GSM 11.12 phase 2 to operate the GsmTerminal.
The SIM card must be inserted in the card holder to put GsmTerminal into operation.

1. Make sure that there is no voltage applied to GsmTerminal.
2. Operate the eject mechanism (yellow pin next to the card holder) to open the card holder by pressing it down with a pen, for example.



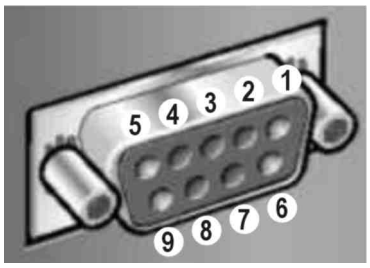
3. Insert the SIM card in the SIM card holder and push it back into the housing.



Interference immunity

- Electrostatic discharge requirements in accordance with ETS 300-342-1

EIA232 The EIA232 interface is the interface for the application software and the connection to PC. The customer application communicates with GsmTerminal by means of AT cellular commands. The EIA232 interface is implemented as a 9 pin D-Sub female socket with a screw fitting.



Interference immunity

- The cable length must not exceed 1.8 m
- Nominal signal range ± 15V
- Max load current 1 A
- Electrical fast transient burst requirements not specified
- Surge immunity requirements not specified
- Electrostatic discharge requirements in accordance with ETS 300-342-1
- Immunity RF common mode 0,15÷80 MHz in accordance with ETS 300-342-1

Purpose of the connections

PIN	Signal	I/O	Description	Parameters
1	DCD	O	THE FUNCTIONS CORRESPOND TO THOSE OF A SERIAL INTERFACE ON THE BASIS OF V.24 PROTOCOL	> +5V HIGH = ACTIVE < -5V LOW
2	RxD	O		> +5V HIGH = LOGIC 0 < -5V LOW = LOGIC 1
3	TxD	I		> +2.4V HIGH = ACTIVE < +1.8 LOW
4	DTR	I		> +2.4V HIGH = ACTIVE < +1.8 LOW
5	GND	X		0 V
6	DSR	O		> +5V HIGH = ACTIVE < -5V LOW
7	RTS	I		> +2.4V HIGH = ACTIVE < +1.8 LOW
8	CTS	O		> +5V HIGH = ACTIVE < -5V LOW
9	RI	O		> +5V HIGH = ACTIVE < -5V LOW

I = Input
O = Output

Start/Stop input

GsmTerminal receives the ignition signal from an external SPST contact connected to terminal 3 and 4, on the top left side.
Use any mechanical or electromechanical switch with 40V $_{MIN}$ / 20mA $_{MIN}$ DC rating.

Polarity
Using electronic switches, the terminal 3 is the positive and terminal 4 is the input.

Overvoltage protection
Overvoltages are suppressed by internal varistors on the start/stop contact input.

Interference immunity

- The cable length must not exceed 3 m
- Nominal signal range 0...+40V
- Max load current 1 A
- Electrical fast transient burst protection requirements in accordance with ETS 300-342-1
- Electrostatic discharge requirements in accordance with ETS 300-342-1
- Immunity RF common mode 0,15÷80 MHz in accordance with ETS 300-342-1

External Antenna (type X)

A dual band antenna (GSM900/1800) must be connected to the RF interface available on the type model X.
The connection is implemented as a 50Ω FME male coaxial jack at the end of a short RG174 cable stub exiting from the upper terminal side of the device.

Interference immunity

- Electrical fast transient burst requirements (cable > 3m)
- Surge immunity requirements not specified
- Electrostatic discharge requirements in accordance with ETS 300-342-1
- Immunity RF common mode 0,15÷80 MHz in accordance with ETS 300-342-1

Purpose of the connections

PIN	Signal	I/O	Description
Inner	RF	I/O	RF input/output
Outer	GND	X	Frame connection

Internal Antenna (type A)

An internal dual band antenna (GSM900/1800) is provided on the front panel of the type model A. This internal omnidirectional antenna can work properly if the front side of the GsmTerminal is not shielded by metallic frames (i.e.: the GsmTerminal is installed inside a metal cabinet).

Interference immunity

- Electrostatic discharge requirements in accordance with ETS 300-342-1
- Immunity RF common mode 0,15÷80 MHz in accordance with ETS 300-342-1

Startup

Before startup, the external components must be connected. The SIM card must be inserted in a deenergized state.
GsmTerminal is ready for operation when supply voltage is applied and the ignition contact is closed.
The GsmTerminal starts the network search and registers with network operator.
Please read the following conditions for switching the GsmTerminal on and off.

Shutdown

When the light indicator flashes 3 times with long interval between, the GsmTerminal is powered but not operative.

Permanent Operation

To let GsmTerminal operate continuously put a wire jumper between terminal 3 and 4.
At each power on the ignition sequence will take place and after few seconds the light turns into slow flashing and the terminal becomes operative.

Hardware Controlled Operation

Using an external SPST contact connected to terminal 3 and 4 it's possible to control the GsmTerminal.
Closing the contact the GsmTerminal will be ignited and becomes operative after few seconds.
Opening the contact the GsmTerminal will be shut down immediately.

Software Controlled Operation

Leaving external contact open the GsmTerminal can be controlled by means of software control.
Any activity detected on the EIA-232 port will ignite the GsmTerminal that becomes operative after few seconds.
Sending specific AT#SHDN command the module will be shut down immediately.

Operating Status / Indicator

The light indicator on the front panel display the following operating states of GsmTerminal :

Operating state	LED Indicator
- Power supply off	OFF
- During startup sequence	ON ♦
- Network search - SIM card not installed - PIN not entered - GSM network unavailable	FLASHES RAPIDLY ♣
- Standby (registered in the network)	FLASHES SLOWLY
- Connected (data transfer in progress)	ON
- Shutdown (either hardware or software)	3 FLASHES WITH LONG INTERVAL

♦ Usually the startup takes 1÷2 seconds from power-on or ignition signal.

♣ The network search takes few seconds till the GsmTerminal is registered. If the LED indicator continues to flash rapidly, this means that no SIM card is inserted, no PIN number is entered or no GSM network is available.

Operating Status / Indicator

Network search In the network search state the GsmTerminal searches for a GSM network in order to register to main operator or to the roaming service provider.

Standby In the Standby state, the GsmTerminal is registered in the network and ready to send and receive. Paging is performed with the GSM network in order to obtain synchronisation with the GSM network. Power consumption in this state depends on the current network availability.
It's possible to activate the energy saving function that reduces the power consumption during idle time (see AT+CFUN command).

Connected In this state a connection has been established between two subscribers via the GSM network. Power consumption is at maximum and depends on the GSM network availability and several conditions. (hopping sequences, antenna coupling...)

Command control

AT command control

The GsmTerminal is controlled and programmed by means of AT commands.
Full set of AT commands are available on the technical literature T1010eng.

Data transfer between host DTE and GsmTerminal during data transfer is limited to 14400 bps.

Data transfer between host DTE and GsmTerminal during command mode can reach 115200 bps.
The user can modify the data transfer rate by means of AT commands.
Factory default configuration is AUTOBAUD mode, the GsmTerminal can automatically detect the host DTE data rate.

Firmware update

The firmware update for the GsmTerminal takes place via the EIA232 interface.
Request the flashprogrammer software at this e-mail address : GsmTerminal@contrive.it.

Tracking/Maintenance

Tracking Each GsmTerminal can be identified by its own IMEI number.
The IMEI number is printed on the front panel of the GsmTerminal.
The IMEI number is associated to each product, resellers must keep information of customers and associated product IMEI number.

Maintenance Treat the SIM card with the same care as your credit card. Do not bend or scratch SIM card or expose it to static electricity.
Do not use chemical cleaning agent, on the SIM card and the GsmTerminal.
Do not remove any cover or label from GsmTerminal.

WARRANTIES Contrive guarantees for two years from the date of manufacture of its product to replace, or, at its option, to repair any product or part thereof which is found defective in material or workmanship or which otherwise fails to conform to the description of its sales order.
Contrive makes no warranty of merchantability or any other warranty express or implied.
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